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<110> Johnson, Gary L.

<120> Method And Product For Regulating Cell Responsiveness To External Signals

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<150> 08/440,421

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<151> 1995-04-24

<150> 08/472,934

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 Gly Met Lys Ser Val Thr Gly Thr Pro Tyr Trp Met Ser Pro Glu Val
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 atc agt gga gaa ggc tat gga aga aaa gca gac atc tgg agt gta gca 2109
 Ile Ser Gly Glu Gly Tyr Gly Arg Lys Ala Asp Ile Trp Ser Val Ala
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 tgt act gtg gta gaa atg cta act gaa aag cca cct tgg gct gaa ttt 2157
 Cys Thr Val Val Glu Met Leu Thr Glu Lys Pro Pro Trp Ala Glu Phe
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 gaa gca atg gct gcc atc ttt aag atc gcc act cag cca acg aac cca 2205
 Glu Ala Met Ala Ala Ile Phe Lys Ile Ala Thr Gln Pro Thr Asn Pro
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 aag ctg cca cct cat gtc tca gac tat act cgg gac ttc ctc aaa cgg 2253
 Lys Leu Pro Pro His Val Ser Asp Tyr Thr Arg Asp Phe Leu Lys Arg
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 Ile Phe Val Glu Ala Lys Leu Arg Pro Ser Ala Glu Glu Leu Leu Arg
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 cac atg ttt gtg cat tat cac tagcagcggc ggcttcggtc ctccaccagc 2352
 His Met Phe Val His Tyr His
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 tccatcctcg cggccacctt ctctcttact gcactttcct tttttataaa aaagagagat 2412
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 <213> Mus musculus

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Asn Ile Glu Glu Glu Lys Arg Ile Leu Gln Val Thr Arg Pro Val Lys
 50 55 60
 Leu Glu Asp Leu Arg Ser Lys Ser Lys Ile Ala Phe Gly Gln Ser Met
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 Asp Leu His Tyr Thr Asn Asn Glu Leu Val Ile Pro Leu Thr Thr Gln
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 Asp Asp Leu Asp Lys Ala Val Glu Leu Leu Asp Arg Ser Ile His Met
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 Lys Ser Leu Lys Ile Leu Leu Val Val Asn Gly Ser Thr Gln Ala Thr
 115 120 125
 Asn Leu Glu Pro Ser Pro Ser Pro Glu Asp Leu Asn Asn Thr Pro Leu
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 Asp Arg Ser Ser Pro Pro Pro Gly Tyr Ile Pro Asp Ile Leu His Gln
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 Ile Ala Arg Asn Gly Ser Phe Thr Ser Ile Asn Ser Glu Gly Glu Phe
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 195 200 205
 Pro Glu Asn Ser Gly Ser Gly Ser Cys Pro Ser Leu Asp Ser Pro Leu
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 Asp Gly Glu Ser Tyr Pro Lys Ser Arg Met Pro Arg Ala Gln Ser Tyr
 225 230 235 240
 Pro Asp Asn His Gln Glu Phe Thr Asp Tyr Asp Asn Pro Ile Phe Glu
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 Lys Phe Gly Lys Gly Gly Thr Tyr Pro Arg Arg Tyr His Val Ser Tyr
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 His His Gln Glu Tyr Asn Asp Gly Arg Lys Thr Phe Pro Arg Ala Arg
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 Arg Thr Gln Gly Thr Ser Phe Arg Ser Pro Val Ser Phe Ser Pro Thr
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 Asp His Ser Leu Ser Thr Ser Ser Gly Ser Ser Val Phe Thr Pro Glu
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 Tyr Asp Asp Ser Arg Ile Arg Arg Arg Gly Ser Asp Ile Asp Asn Pro
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 Thr Leu Thr Val Thr Asp Ile Ser Pro Pro Ser Arg Ser Pro Arg Ala
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 Pro Thr Asn Trp Arg Leu Gly Lys Leu Leu Gly Gln Gly Ala Phe Gly
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 Arg Val Tyr Leu Cys Tyr Asp Val Asp Thr Gly Arg Glu Leu Ala Val
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Lys Gln Val Gln Phe Asn Pro Glu Ser Pro Glu Thr Ser Lys Glu Val
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 Asn Ala Leu Glu Cys Glu Ile Gln Leu Leu Lys Asn Leu Leu His Glu
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 Arg Gln Ile Leu Glu Gly Val His Tyr Leu His Ser Asn Met Ile Val
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 His Arg Asp Ile Lys Gly Ala Asn Ile Leu Arg Asp Ser Thr Gly Asn
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 Ile Lys Leu Gly Asp Phe Gly Ala Ser Lys Arg Leu Gln Thr Ile Cys
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 Ser Pro Glu Val Ile Ser Gly Glu Gly Tyr Gly Arg Lys Ala Asp Ile
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 Trp Ser Val Ala Cys Thr Val Val Glu Met Leu Thr Glu Lys Pro Pro
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 Pro Thr Asn Pro Lys Leu Pro Pro His Val Ser Asp Tyr Thr Arg Asp
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<213> Mus musculus

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agaaccattt	tcctaatttt	caaattattg	agctggtcgc	gcata	atg gat gat cag	477
					Met Asp Asp Gln	
					1	
caa gct ttg aat tca atc atg caa gat ttg gct gtc ctt cat aag gcc						525
Gln Ala Leu Asn Ser Ile Met Gln Asp Leu Ala Val Leu His Lys Ala						
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agt cgg cca gca tta tct tta caa gaa acc agg aaa gca aaa cct tca						573
Ser Arg Pro Ala Leu Ser Leu Gln Glu Thr Arg Lys Ala Lys Pro Ser						
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tca cca aaa aaa cag aat gat gtt cga gtc aaa ttt gaa cat aga gga						621
Ser Pro Lys Lys Gln Asn Asp Val Arg Val Lys Phe Glu His Arg Gly						
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gaa aaa agg atc ctg cag gtt act aga cca gtt aaa cta gaa gac ctg						669
Glu Lys Arg Ile Leu Gln Val Thr Arg Pro Val Lys Leu Glu Asp Leu						
	55		60		65	
aga tct aag tct aag atc gcc ttt ggg cag tct atg gat cta cac tat						717
Arg Ser Lys Ser Lys Ile Ala Phe Gly Gln Ser Met Asp Leu His Tyr						
	70		75		80	
acc aac aat gag ttg gta att ccg tta act acc caa gat gac ttg gac						765
Thr Asn Asn Glu Leu Val Ile Pro Leu Thr Thr Gln Asp Asp Leu Asp						
	85		90		95	100
aaa gct gtg gaa ctg ctg gat cgc agt att cac atg aag agt ctc aag						813
Lys Ala Val Glu Leu Leu Asp Arg Ser Ile His Met Lys Ser Leu Lys						
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ata tta ctt gta gta aat ggg agt aca cag gct act aat tta gaa cca						861
Ile Leu Leu Val Val Asn Gly Ser Thr Gln Ala Thr Asn Leu Glu Pro						
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Ser Pro Ser Pro Glu Asp Leu Asn Asn Thr Pro Leu Gly Ala Glu Arg						
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Lys Lys Arg Leu Ser Val Val Gly Pro Pro Asn Arg Asp Arg Ser Ser						
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cct cct cca gga tac att cca gac ata cta cac cag att gcc cgg aat						1005
Pro Pro Pro Gly Tyr Ile Pro Asp Ile Leu His Gln Ile Ala Arg Asn						
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ggg tca ttc act agc atc aac agt gaa gga gag ttc att cca gag agc						1053
Gly Ser Phe Thr Ser Ile Asn Ser Glu Gly Glu Phe Ile Pro Glu Ser						
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atg gac caa atg ctg gat cca ttg tct tta agc agc cct gaa aat tct						1101
Met Asp Gln Met Leu Asp Pro Leu Ser Leu Ser Ser Pro Glu Asn Ser						
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Gly Ser Gly Ser Cys Pro Ser Leu Asp Ser Pro Leu Asp Gly Glu Ser	
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Tyr Pro Lys Ser Arg Met Pro Arg Ala Gln Ser Tyr Pro Asp Asn His	
230 235 240	
cag gag ttt aca gac tat gat aac ccc att ttt gag aaa ttt gga aaa	1245
Gln Glu Phe Thr Asp Tyr Asp Asn Pro Ile Phe Glu Lys Phe Gly Lys	
245 250 255 260	
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Gly Gly Thr Tyr Pro Arg Arg Tyr His Val Ser Tyr His His Gln Glu	
265 270 275	
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Tyr Asn Asp Gly Arg Lys Thr Phe Pro Arg Ala Arg Arg Thr Gln Gly	
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Thr Ser Phe Arg Ser Pro Val Ser Phe Ser Pro Thr Asp His Ser Leu	
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Ser Thr Ser Ser Gly Ser Ser Val Phe Thr Pro Glu Tyr Asp Asp Ser	
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Arg Ile Arg Arg Arg Gly Ser Asp Ile Asp Asn Pro Thr Leu Thr Val	
325 330 335 340	
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Arg Leu Gly Lys Leu Leu Gly Gln Gly Ala Phe Gly Arg Val Tyr Leu	
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Cys Tyr Asp Val Asp Thr Gly Arg Glu Leu Ala Val Lys Gln Val Gln	
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Phe Asn Pro Glu Ser Pro Glu Thr Ser Lys Glu Val Asn Ala Leu Glu	
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Cys Glu Ile Gln Leu Leu Lys Asn Leu Leu His Glu Arg Ile Val Gln	
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tat tat ggc tgt ttg agg gat cct cag gag aaa aca ctt tcc atc ttt	1773
Tyr Tyr Gly Cys Leu Arg Asp Pro Gln Glu Lys Thr Leu Ser Ile Phe	
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Met Glu Tyr Met Pro Gly Gly Ser Ile Lys Asp Gln Leu Lys Ala Tyr	
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Gly Ala Leu Thr Glu Asn Val Thr Arg Lys Tyr Thr Arg Gln Ile Leu	
455 460 465	

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 Glu Gly Val His Tyr Leu His Ser Asn Met Ile Val His Arg Asp Ile
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 485 490 495 500

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 505 510 515

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 Gly Met Lys Ser Val Thr Gly Thr Pro Tyr Trp Met Ser Pro Glu Val
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atc agt gga gaa ggc tat gga aga aaa gca gac atc tgg agt gta gca 2109
 Ile Ser Gly Glu Gly Tyr Gly Arg Lys Ala Asp Ile Trp Ser Val Ala
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tgt act gtg gta gaa atg cta act gaa aag cca cct tgg gct gaa ttt 2157
 Cys Thr Val Val Glu Met Leu Thr Glu Lys Pro Pro Trp Ala Glu Phe
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gaa gca atg gct gcc atc ttt aag atc gcc act cag cca acg aac cca 2205
 Glu Ala Met Ala Ala Ile Phe Lys Ile Ala Thr Gln Pro Thr Asn Pro
 565 570 575 580

aag ctg cca cct cat gtc tca gac tat act cgg gac ttc ctc aaa cgg 2253
 Lys Leu Pro Pro His Val Ser Asp Tyr Thr Arg Asp Phe Leu Lys Arg
 585 590 595

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 Ile Phe Val Glu Ala Lys Leu Arg Pro Ser Ala Glu Glu Leu Leu Arg
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cac atg ttt gtg cat tat cac tagcagcggc ggcttcggtc ctccaccagc 2352
 His Met Phe Val His Tyr His
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 Ala Lys Pro Ser Ser Pro Lys Lys Gln Asn Asp Val Arg Val Lys Phe
 35 40 45
 Glu His Arg Gly Glu Lys Arg Ile Leu Gln Val Thr Arg Pro Val Lys
 50 55 60

Leu	Glu	Asp	Leu	Arg	Ser	Lys	Ser	Lys	Ile	Ala	Phe	Gly	Gln	Ser	Met	65	70	75	80
Asp	Leu	His	Tyr	Thr	Asn	Asn	Glu	Leu	Val	Ile	Pro	Leu	Thr	Thr	Gln	85	90	95	
Asp	Asp	Leu	Asp	Lys	Ala	Val	Glu	Leu	Leu	Asp	Arg	Ser	Ile	His	Met	100	105	110	
Lys	Ser	Leu	Lys	Ile	Leu	Leu	Val	Val	Asn	Gly	Ser	Thr	Gln	Ala	Thr	115	120	125	
Asn	Leu	Glu	Pro	Ser	Pro	Ser	Pro	Glu	Asp	Leu	Asn	Asn	Thr	Pro	Leu	130	135	140	
Gly	Ala	Glu	Arg	Lys	Lys	Arg	Leu	Ser	Val	Val	Gly	Pro	Pro	Asn	Arg	145	150	155	160
Asp	Arg	Ser	Ser	Pro	Pro	Pro	Gly	Tyr	Ile	Pro	Asp	Ile	Leu	His	Gln	165	170	175	
Ile	Ala	Arg	Asn	Gly	Ser	Phe	Thr	Ser	Ile	Asn	Ser	Glu	Gly	Glu	Phe	180	185	190	
Ile	Pro	Glu	Ser	Met	Asp	Gln	Met	Leu	Asp	Pro	Leu	Ser	Leu	Ser	Ser	195	200	205	
Pro	Glu	Asn	Ser	Gly	Ser	Gly	Ser	Cys	Pro	Ser	Leu	Asp	Ser	Pro	Leu	210	215	220	
Asp	Gly	Glu	Ser	Tyr	Pro	Lys	Ser	Arg	Met	Pro	Arg	Ala	Gln	Ser	Tyr	225	230	235	240
Pro	Asp	Asn	His	Gln	Glu	Phe	Thr	Asp	Tyr	Asp	Asn	Pro	Ile	Phe	Glu	245	250	255	
Lys	Phe	Gly	Lys	Gly	Gly	Thr	Tyr	Pro	Arg	Arg	Tyr	His	Val	Ser	Tyr	260	265	270	
His	His	Gln	Glu	Tyr	Asn	Asp	Gly	Arg	Lys	Thr	Phe	Pro	Arg	Ala	Arg	275	280	285	
Arg	Thr	Gln	Gly	Thr	Ser	Phe	Arg	Ser	Pro	Val	Ser	Phe	Ser	Pro	Thr	290	295	300	
Asp	His	Ser	Leu	Ser	Thr	Ser	Ser	Gly	Ser	Ser	Val	Phe	Thr	Pro	Glu	305	310	315	320
Tyr	Asp	Asp	Ser	Arg	Ile	Arg	Arg	Arg	Gly	Ser	Asp	Ile	Asp	Asn	Pro	325	330	335	
Thr	Leu	Thr	Val	Thr	Asp	Ile	Ser	Pro	Pro	Ser	Arg	Ser	Pro	Arg	Ala	340	345	350	
Pro	Thr	Asn	Trp	Arg	Leu	Gly	Lys	Leu	Leu	Gly	Gln	Gly	Ala	Phe	Gly	355	360	365	
Arg	Val	Tyr	Leu	Cys	Tyr	Asp	Val	Asp	Thr	Gly	Arg	Glu	Leu	Ala	Val	370	375	380	
Lys	Gln	Val	Gln	Phe	Asn	Pro	Glu	Ser	Pro	Glu	Thr	Ser	Lys	Glu	Val	385	390	395	400

Asn	Ala	Leu	Glu	Cys	Glu	Ile	Gln	Leu	Leu	Lys	Asn	Leu	Leu	His	Glu	
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Arg	Ile	Val	Gln	Tyr	Tyr	Gly	Cys	Leu	Arg	Asp	Pro	Gln	Glu	Lys	Thr	
				420					425					430		
Leu	Ser	Ile	Phe	Met	Glu	Tyr	Met	Pro	Gly	Gly	Ser	Ile	Lys	Asp	Gln	
				435					440					445		
Leu	Lys	Ala	Tyr	Gly	Ala	Leu	Thr	Glu	Asn	Val	Thr	Arg	Lys	Tyr	Thr	
				450					455					460		
Arg	Gln	Ile	Leu	Glu	Gly	Val	His	Tyr	Leu	His	Ser	Asn	Met	Ile	Val	
				465					470					475		
His	Arg	Asp	Ile	Lys	Gly	Ala	Asn	Ile	Leu	Arg	Asp	Ser	Thr	Gly	Asn	
				485					490					495		
Ile	Lys	Leu	Gly	Asp	Phe	Gly	Ala	Ser	Lys	Arg	Leu	Gln	Thr	Ile	Cys	
				500					505					510		
Leu	Ser	Gly	Thr	Gly	Met	Lys	Ser	Val	Thr	Gly	Thr	Pro	Tyr	Trp	Met	
				515					520					525		
Ser	Pro	Glu	Val	Ile	Ser	Gly	Glu	Gly	Tyr	Gly	Arg	Lys	Ala	Asp	Ile	
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Trp	Ser	Val	Ala	Cys	Thr	Val	Val	Glu	Met	Leu	Thr	Glu	Lys	Pro	Pro	
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Trp	Ala	Glu	Phe	Glu	Ala	Met	Ala	Ala	Ile	Phe	Lys	Ile	Ala	Thr	Gln	
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Pro	Thr	Asn	Pro	Lys	Leu	Pro	Pro	His	Val	Ser	Asp	Tyr	Thr	Arg	Asp	
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Phe	Leu	Lys	Arg	Ile	Phe	Val	Glu	Ala	Lys	Leu	Arg	Pro	Ser	Ala	Glu	
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gccgggggatg tagcggggcca acctgctcat gccacagcgc ccggccgcgg ccgagccgga 240
gcctgggggag gcggcggggg ccccgagcgc agccacggc ccccgcgcgg agccaggccc 300
gctgccgtcc ccgcgcgccg ctcccccggc atgcagcccc ggctgcggag gtqacacttc 360
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Met Asp Glu Gln Glu	
1 5	
gca tta gac tgc atc atg aag gac ctg gtg gcc ctc cag atg agc cga	462
Ala Leu Asp Ser Ile Met Lys Asp Leu Val Ala Leu Gln Met Ser Arg	
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cga acc cgg ttg tct gga tat gag acc atg aag aat aag gac aca ggt	510
Arg Thr Arg Leu Ser Gly Tyr Glu Thr Met Lys Asn Lys Asp Thr Gly	
25 30 35	
cac cca aac agg cag agt gac gtc aga atc aag ttt gaa cac aat ggg	558
His Pro Asn Arg Gln Ser Asp Val Arg Ile Lys Phe Glu His Asn Gly	
40 45 50	
gag aga cga att ata gca ttc agc cgg cct gtg aga tac gaa gat gtg	606
Glu Arg Arg Ile Ile Ala Phe Ser Arg Pro Val Arg Tyr Glu Asp Val	
55 60 65	
gag cac aag gtg aca aca gtc ttt ggg cag cct ctt gat ttg cat tat	654
Glu His Lys Val Thr Thr Val Phe Gly Gln Pro Leu Asp Leu His Tyr	
70 75 80 85	
atg aat aat gag ctc tcc atc ctg ttg aaa aac caa gat gat ctc gat	702
Met Asn Asn Glu Leu Ser Ile Leu Leu Lys Asn Gln Asp Asp Leu Asp	
90 95 100	
aaa gcc att gac att ttg gat aga agc tca agt atg aaa agc ctt agg	750
Lys Ala Ile Asp Ile Leu Asp Arg Ser Ser Ser Met Lys Ser Leu Arg	
105 110 115	
ata cta ctg tta tcc caa gac aga aac cat act agt tcc tct ccc cac	798
Ile Leu Leu Leu Ser Gln Asp Arg Asn His Thr Ser Ser Ser Pro His	
120 125 130	
tct gga gtg tcc agg cag gtt cgg atc aag cct tcc cag tct gca ggg	846
Ser Gly Val Ser Arg Gln Val Arg Ile Lys Pro Ser Gln Ser Ala Gly	
135 140 145	
gat ata aat acc atc tac caa gct cct gag ccc aga agc agg cac ctg	894
Asp Ile Asn Thr Ile Tyr Gln Ala Pro Glu Pro Arg Ser Arg His Leu	
150 155 160 165	
tct gtc agc tcc cag aac cct ggc cga agc tct cct ccc ccg gga tat	942
Ser Val Ser Ser Gln Asn Pro Gly Arg Ser Ser Pro Pro Pro Gly Tyr	
170 175 180	
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Val Pro Glu Arg Gln Gln His Ile Ala Arg Gln Gly Ser Tyr Thr Ser	
185 190 195	
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Ile Asn Ser Glu Gly Glu Phe Ile Pro Glu Thr Ser Glu Gln Cys Met	
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Leu Asp Pro Leu Ser Ser Ala Glu Asn Ser Leu Ser Gly Ser Cys Gln	
215 220 225	
tcc ttg gac agg tca gca gac agc cca tcc ttc agg aaa tca caa atg	1134
Ser Leu Asp Arg Ser Ala Asp Ser Pro Ser Phe Arg Lys Ser Gln Met	
230 235 240 245	

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Ser Arg Ala Arg Ser Phe Pro Asp Asn Arg Lys Glu Cys Ser Asp Arg	
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Glu Thr Gln Leu Tyr Asp Lys Gly Val Lys Gly Gly Thr Tyr Pro Arg	
265 270 275	
cgc tac cat gtg tct gtg cat cac aaa gac tac aat gat ggc aga aga	1278
Arg Tyr His Val Ser Val His His Lys Asp Tyr Asn Asp Gly Arg Arg	
280 285 290	
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Thr Phe Pro Arg Ile Arg Arg His Gln Gly Asn Leu Phe Thr Leu Val	
295 300 305	
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Pro Ser Ser Arg Ser Leu Ser Thr Asn Gly Glu Asn Met Gly Val Ala	
310 315 320 325	
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Val Gln Tyr Leu Asp Pro Arg Gly Arg Leu Arg Ser Ala Asp Ser Glu	
330 335 340	
aat gcc ctc act gtg cag gaa agg aat gtg cca acc aaa tct cct agt	1470
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Gly Arg Val Tyr Leu Cys Tyr Asp Val Asp Thr Gly Arg Glu Leu Ala	
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Ser Lys Gln Val Gln Phe Asp Pro Asp Ser Pro Glu Thr Ser Lys Glu	
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Gln Leu Lys Ala Tyr Gly Ala Leu Thr Glu Ser Val Thr Arg Lys Tyr	
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Thr Arg Gln Ile Leu Glu Gly Met Ser Tyr Leu His Ser Asn Met Ile	
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 Val Trp Ser Leu Gly Cys Thr Val Val Glu Met Leu Thr Glu Lys Pro
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 Pro Trp Ala Glu Tyr Glu Ala Met Ala Ala Ile Phe Lys Ile Ala Thr
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 Gln Pro Thr Asn Pro Gln Leu Pro Ser His Ile Ser Glu His Gly Arg
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 Glu Glu Leu Leu Thr His His Phe Ala Gln Leu Val Tyr
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Asn	Lys	Asp	Thr	Gly	His	Pro	Asn	Arg	Gln	Ser	Asp	Val	Arg	Ile	Lys	35	40	45	
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Gly	Thr	Tyr	Pro	Arg	Arg	Tyr	His	Val	Ser	Val	His	His	Lys	Asp	Tyr	275	280	285	
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 Asn Met Gly Val Ala Val Gln Tyr Leu Asp Pro Arg Gly Arg Leu Arg
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 Asp Arg Ala Glu Lys Ile Leu Thr Ile Phe Met Glu Tyr Met Pro Gly
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aagaggtcct  aaagggcggg  ctccctg  atg  aag  cag  tat  tac  cag  ttc  atg  ctg  773
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His Tyr Ile Arg Gly Gly Glu Ala Gln Ala Gly Lys Leu Phe Cys Asp
75 80 85

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Ile Ala Gly Met Leu Leu Lys Ser Thr Gly Ser Phe Leu Glu Ser Gly	
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Lys Glu Leu Phe His Glu Ala Arg Glu Arg Ala Ser Lys Ala Leu Gly	
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 Glu
 890

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 Glu Trp Asn Phe Thr Lys Glu Ile Thr His Tyr Ile Arg Gly Gly Glu
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 ctc tcg cac tgc ctg gaa agt gac ccg aag ata cgg tgg aca gcc agc 4872
 Leu Ser His Cys Leu Glu Ser Asp Pro Lys Ile Arg Trp Thr Ala Ser
 1570 1575 1580
 cag ctc ctc gac cac gct ttt gtc aag gtt tgc aca gat gaa gag 4917
 Gln Leu Leu Asp His Ala Phe Val Lys Val Cys Thr Asp Glu Glu
 1585 1590 1595
 tgaagtgaac cagtccgtgg cctagtagtg tgtggacaga atcccgatgat cactactgta 4977
 tgtaatatattt acataaaagac tgcagcgcag ggggccttcc taacctccca ggactgaaga 5037
 ctacaggggt gacaagcctc acttctgctg ctccctgtcgc ctgctgagtg acagtgtgta 5097
 gggttaaagga gccgcacggt aagtgccatt actactgtac acggggccacc gcctctgtcc 5157
 cctccgaccc tctcgtgact gagaaccaac cgtgtcatca gcacagtgtt tttgagctcc 5217
 tgggggttcag aagaacatgt agtgttcccg ggtgtccggg acgtttattt caacctcctg 5277
 gtcggttggt ctgactgtgg agcctccttg ttcgaaagct gcaggtttgt tatgcaaagg 5337
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aaaaaaaaaa aaaaaaaa

5414

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<212> PRT

<213> Mus musculus

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Met Arg Asp Ala Ile Ala Glu Pro Val Pro Pro Pro Ala Leu Ala Asp
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Thr Pro Ala Ala Ala Met Glu Glu Leu Arg Pro Ala Pro Pro Pro Gln
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Pro Glu Pro Asp Pro Glu Cys Cys Pro Ala Ala Arg Gln Glu Cys Met
      35              40              45

Leu Gly Glu Ser Ala Arg Lys Ser Met Glu Ser Asp Pro Glu Asp Phe
      50              55              60

Ser Asp Glu Thr Asn Thr Glu Thr Leu Tyr Gly Thr Ser Pro Pro Ser
      65              70              75              80

Thr Pro Arg Gln Met Lys Arg Leu Ser Ala Lys His Gln Arg Asn Ser
      85              90              95

Ala Gly Arg Pro Ala Ser Arg Ser Asn Leu Lys Glu Lys Met Asn Thr
      100              105              110

Pro Ser Gln Ser Pro His Lys Asp Leu Gly Lys Gly Val Glu Thr Val
      115              120              125

Glu Glu Tyr Ser Tyr Lys Gln Glu Lys Lys Ile Arg Ala Thr Leu Arg
      130              135              140

Thr Thr Glu Arg Asp His Lys Lys Asn Ala Gln Cys Ser Phe Met Leu
      145              150              155              160

Asp Ser Val Ala Gly Ser Leu Pro Lys Lys Ser Ile Pro Asp Val Asp
      165              170              175

Leu Asn Lys Pro Tyr Leu Ser Leu Gly Cys Ser Asn Ala Lys Leu Pro
      180              185              190

Val Ser Met Pro Met Pro Ile Ala Arg Thr Ala Arg Gln Thr Ser Arg
      195              200              205

Thr Asp Cys Pro Ala Asp Arg Leu Lys Phe Phe Glu Thr Leu Arg Leu
      210              215              220

Leu Leu Lys Leu Thr Ser Val Ser Lys Lys Lys Asp Arg Glu Gln Arg
      225              230              235              240

Gly Gln Glu Asn Thr Ala Ala Phe Trp Phe Asn Arg Ser Asn Glu Leu
      245              250              255

Ile Trp Leu Glu Leu Gln Ala Trp His Ala Gly Arg Thr Ile Asn Asp
      260              265              270

Gln Asp Leu Phe Leu Tyr Thr Ala Arg Gln Ala Ile Pro Asp Ile Ile
      275              280              285

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Asn Glu Ile Leu Thr Phe Lys Val Asn Tyr Gly Ser Ile Ala Phe Ser
 290 295 300
 Ser Asn Gly Ala Gly Phe Asn Gly Pro Leu Val Glu Gly Gln Cys Arg
 305 310 315 320
 Thr Pro Gln Glu Thr Asn Arg Val Gly Cys Ser Ser Tyr His Glu His
 325 330 335
 Leu Gln Arg Gln Arg Val Ser Phe Glu Gln Val Lys Arg Ile Met Glu
 340 345 350
 Leu Leu Glu Tyr Met Glu Ala Leu Tyr Pro Ser Leu Gln Ala Leu Gln
 355 360 365
 Lys Asp Tyr Glu Arg Tyr Ala Ala Lys Asp Phe Glu Asp Arg Val Gln
 370 375 380
 Ala Leu Cys Leu Trp Leu Asn Ile Thr Lys Asp Leu Asn Gln Lys Leu
 385 390 395 400
 Arg Ile Met Gly Thr Val Leu Gly Ile Lys Asn Leu Ser Asp Ile Gly
 405 410 415
 Trp Pro Val Phe Glu Ile Pro Ser Pro Arg Pro Ser Lys Gly Tyr Glu
 420 425 430
 Pro Glu Asp Glu Val Glu Asp Thr Glu Val Glu Leu Arg Glu Leu Glu
 435 440 445
 Ser Gly Thr Glu Glu Ser Asp Glu Glu Pro Thr Pro Ser Pro Arg Val
 450 455 460
 Pro Glu Leu Arg Leu Ser Thr Asp Thr Ile Leu Asp Ser Arg Ser Gln
 465 470 475 480
 Gly Cys Val Ser Arg Lys Leu Glu Arg Leu Glu Ser Glu Glu Asp Ser
 485 490 495
 Ile Gly Trp Gly Thr Ala Asp Cys Gly Pro Glu Ala Ser Arg His Cys
 500 505 510
 Leu Thr Ser Ile Tyr Arg Pro Phe Val Asp Lys Ala Leu Lys Gln Met
 515 520 525
 Gly Leu Arg Lys Leu Ile Leu Arg Leu His Lys Leu Met Asn Gly Ser
 530 535 540
 Leu Gln Arg Ala Arg Val Ala Leu Val Lys Asp Asp Arg Pro Val Glu
 545 550 555 560
 Phe Ser Asp Phe Pro Gly Pro Met Trp Gly Ser Asp Tyr Val Gln Leu
 565 570 575
 Ser Gly Thr Pro Pro Ser Ser Glu Gln Lys Cys Ser Ala Val Ser Trp
 580 585 590
 Glu Glu Leu Arg Ala Met Asp Leu Pro Ser Phe Glu Pro Ala Phe Leu
 595 600 605
 Val Leu Cys Arg Val Leu Leu Asn Val Ile His Glu Cys Leu Lys Leu
 610 615 620

Arg Leu Glu Gln Arg Pro Ala Gly Glu Pro Ser Leu Leu Ser Ile Lys
 625 630 635 640
 Gln Leu Val Arg Glu Cys Lys Glu Val Leu Lys Gly Gly Leu Leu Met
 645 650 655
 Lys Gln Tyr Tyr Gln Phe Met Leu Gln Glu Val Leu Gly Gly Leu Glu
 660 665 670
 Lys Thr Asp Cys Asn Met Asp Ala Phe Glu Glu Asp Leu Gln Lys Met
 675 680 685
 Leu Met Val Tyr Phe Asp Tyr Met Arg Ser Trp Ile Gln Met Leu Gln
 690 695 700
 Gln Leu Pro Gln Ala Ser His Ser Leu Lys Asn Leu Leu Glu Glu Glu
 705 710 715 720
 Trp Asn Phe Thr Lys Glu Ile Thr His Tyr Ile Arg Gly Gly Glu Ala
 725 730 735
 Gln Ala Gly Lys Leu Phe Cys Asp Ile Ala Gly Met Leu Leu Lys Ser
 740 745 750
 Thr Gly Ser Phe Leu Glu Ser Gly Leu Gln Glu Ser Cys Ala Glu Leu
 755 760 765
 Trp Thr Ser Ala Asp Asp Asn Gly Ala Ala Asp Glu Leu Arg Arg Ser
 770 775 780
 Val Ile Glu Ile Ser Arg Ala Leu Lys Glu Leu Phe His Glu Ala Arg
 785 790 795 800
 Glu Arg Ala Ser Lys Ala Leu Gly Phe Ala Lys Met Leu Arg Lys Asp
 805 810 815
 Leu Glu Ile Ala Ala Glu Phe Val Leu Ser Ala Ser Ala Arg Glu Leu
 820 825 830
 Leu Asp Ala Leu Lys Ala Lys Gln Tyr Val Lys Val Gln Ile Pro Gly
 835 840 845
 Leu Glu Asn Leu His Val Phe Val Pro Asp Ser Leu Ala Glu Glu Lys
 850 855 860
 Lys Ile Ile Leu Gln Leu Leu Asn Ala Ala Thr Gly Lys Asp Cys Ser
 865 870 875 880
 Lys Asp Pro Asp Asp Val Phe Met Asp Ala Phe Leu Leu Leu Thr Lys
 885 890 895
 His Gly Asp Arg Ala Arg Asp Ser Glu Asp Gly Trp Gly Thr Trp Glu
 900 905 910
 Ala Arg Ala Val Lys Ile Val Pro Gln Val Glu Thr Val Asp Thr Leu
 915 920 925
 Arg Ser Met Gln Val Asp Asn Leu Leu Leu Val Val Met Glu Ser Ala
 930 935 940
 His Leu Val Leu Gln Arg Lys Ala Phe Gln Gln Ser Ile Glu Gly Leu
 945 950 955 960

Met Thr Val Arg His Glu Gln Thr Ser Ser Gln Pro Ile Ile Ala Lys
 965 970 975
 Gly Leu Gln Gln Leu Lys Asn Asp Ala Leu Glu Leu Cys Asn Arg Ile
 980 985 990
 Ser Asp Ala Ile Asp Arg Val Asp His Met Phe Thr Leu Glu Phe Asp
 995 1000 1005
 Ala Glu Val Glu Glu Ser Glu Ser Ala Thr Leu Gln Gln Tyr Tyr Arg
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 Glu Ala Met Ile Gln Gly Tyr Asn Phe Gly Phe Glu Tyr His Lys Glu
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 Tyr Ile Ser Phe Ala Gln Lys Trp Met Asn Tyr Val Leu Thr Lys Cys
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 Phe Leu Gln Ala Ile Glu Pro Ala Phe Ile Ser Ala Leu Pro Glu Asp
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 Asp Phe Leu Ser Leu Gln Ala Leu Met Asn Glu Cys Ile Gly His Val
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 Ile Gly Lys Pro His Ser Pro Val Thr Ala Ile His Arg Asn Ser Pro
 1125 1130 1135
 Arg Pro Val Lys Val Pro Arg Cys His Ser Asp Pro Pro Asn Pro His
 1140 1145 1150
 Leu Ile Ile Pro Thr Pro Glu Gly Phe Ser Thr Arg Ser Val Pro Ser
 1155 1160 1165
 Asp Ala Arg Thr His Gly Asn Ser Val Ala Ala Ala Ala Val Arg
 1170 1175 1180
 Ala Ala Ala Thr Thr Ala Ala Gly Arg Pro Gly Pro Gly Gly Gly Asp
 185 1190 1195 1200
 Ser Val Pro Ala Lys Pro Val Asn Thr Ala Pro Asp Thr Arg Gly Ser
 1205 1210 1215
 Ser Val Pro Glu Asn Asp Arg Leu Ala Ser Ile Ala Ala Glu Leu Gln
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 Phe Arg Ser Leu Ser Arg His Ser Ser Pro Thr Glu Glu Arg Asp Glu
 1235 1240 1245
 Pro Ala Tyr Pro Arg Ser Asp Ser Ser Gly Ser Thr Arg Arg Ser Trp
 1250 1255 1260
 Glu Leu Arg Thr Leu Ile Ser Gln Thr Lys Asp Ser Ala Ser Lys Gln
 265 1270 1275 1280
 Gly Pro Ile Glu Ala Ile Gln Lys Ser Val Arg Leu Phe Glu Glu Arg
 1285 1290 1295

Arg Tyr Arg Glu Met Arg Arg Lys Asn Ile Ile Gly Gln Val Cys Asp
 1300 1305 1310
 Thr Pro Lys Ser Tyr Asp Asn Val Met His Val Gly Leu Arg Lys Val
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 Thr Phe Lys Trp Gln Arg Gly Asn Lys Ile Gly Glu Gly Gln Tyr Gly
 1330 1335 1340
 Lys Val Tyr Thr Cys Ile Ser Val Asp Thr Gly Glu Leu Met Ala Met
 345 1350 1355 1360
 Lys Glu Ile Arg Phe Gln Pro Asn Asp His Lys Thr Ile Lys Glu Thr
 1365 1370 1375
 Ala Asp Glu Leu Lys Ile Phe Glu Gly Ile Lys His Pro Asn Leu Val
 1380 1385 1390
 Arg Tyr Phe Gly Val Glu Leu His Arg Glu Glu Met Tyr Ile Phe Met
 1395 1400 1405
 Glu Tyr Cys Asp Glu Gly Thr Leu Glu Glu Val Ser Arg Leu Gly Leu
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 Gln Glu His Val Ile Arg Leu Tyr Thr Lys Gln Ile Thr Val Ala Ile
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 Asn Val Leu His Glu His Gly Ile Val His Arg Asp Ile Lys Gly Ala
 1445 1450 1455
 Asn Ile Phe Leu Thr Ser Ser Gly Leu Ile Lys Leu Gly Asp Phe Gly
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 Cys Ser Val Lys Leu Lys Asn Asn Ala Gln Thr Met Pro Gly Glu Val
 1475 1480 1485
 Asn Ser Thr Leu Gly Thr Ala Ala Tyr Met Ala Pro Glu Val Ile Thr
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 Arg Ala Lys Gly Glu Gly His Gly Arg Ala Ala Asp Ile Trp Ser Leu
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 Gly Cys Val Val Ile Glu Met Val Thr Gly Lys Arg Pro Trp His Glu
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 Tyr Glu His Asn Phe Gln Ile Met Tyr Lys Val Gly Met Gly His Lys
 1540 1545 1550
 Pro Pro Ile Pro Glu Arg Leu Ser Pro Glu Gly Lys Ala Phe Leu Ser
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<223> N at postion 9 = t or c

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<223> N at postion 20 = g or t

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23

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21

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 1 5 10 15

Ala Ile His Asp
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A2
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